

REMARKS

Claims 1-31 were pending, with claim 13 objected to, claims 20 and 21 allowed, and the remainder of the claims rejected. Claims 13, 15, 18, 19, 20, 23, 24, 25, 27, 29, and 31 are amended herein, and claims 14 and 26 have been canceled. Accordingly, claims 1-13, 15-25, and 27-31 remain active in the case. In view of the claim amendments and the following remarks, reconsideration of the present application is respectfully requested.

Claim Objections, 35 U.S.C. § 112 Rejections, and other Claim Informalities

Claim 13 was objected to for having two recitations of the phrase "a next time slot." Applicant affirmatively states that both instances were intended to refer to the same future time slot for which arbitration is being currently performed. Accordingly, Applicant has followed the Examiner's suggestion and amended the second occurrence to read "the next time slot."

Claim 29, and claim 30 due to its dependency from claim 29, were objected to due to the use of a semicolon where a colon was proper. The Examiner's suggestion to substitute a colon for the semicolon has been followed.

Claims 20 and 23 has been amended to correct trivial informalities of a similar nature as those identified elsewhere by the Examiner. As such, these amendments are not seen as raising any new issue and Applicant respectfully requests that they be entered. First, the preamble of both claims has been amended to provide proper numerical agreement in the preamble and with the rest of the claim—the preamble should read "output ports", not "output port."

Second, although the two claims recite issuing grants to input port *buffers* that win arbitration, the claims later recite an input port winning the arbitration. The second occurrence has been amended to insert the missing word "buffer" and provide proper agreement. A similar problem has also been corrected in two places near the end of claim 20.

Finally, both claims recite conducting input port arbitrations at input port buffers receiving grants from the output port arbitration. The claims then recite accepting one of the grants at each input port buffer *winning the input port arbitration*. These two phrases do not agree, as the only input port buffers that can accept a grant are those that received at least one grant from an output port arbitration. It is also not correct to say that an input port buffer "wins" an input port arbitration, as that arbitration is merely selecting one grant for the input port buffer. Claim 2 also provides an example of correct terminology for this concept. Accordingly, this agreement problem has been corrected by changing the second phrase to

agree with the first, i.e., grants are accepted at each input port buffer winning *at least one output port arbitration*.

Claim 23 was also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to provide antecedent basis for the limitation “the unicast arbitration” in line 18. Applicant has amended the phrase to read “a unicast arbitration” since this is the first recitation of the element in the claim.

Claim 24 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to provide antecedent basis for the limitation “dedicated output ports.” Applicant has clarified the dedication to be the dedication recited earlier in the claim—the amended claim phrase reads “assigned to the ~~dedicated~~ output ports to which the input port buffers are dedicated.” A typographical error was also corrected in claim 24—substituting the intended word “as” for “at”.

Applicant respectfully requests that the amendments correcting each of these minor informalities be entered as they place the claims in better form and raise no new substantive issues.

Claim Rejections – 35 U.S.C. § 103

Claims 1-4, 6-8, 14-18, 24-26, and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fransson (US 6,445,706) in view of Chao (US 6,667,984). Claims 5, 11-12, and 27-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fransson in view of Chao, and further in view of Holden et al. (US 6,188,690). Claims 9-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fransson in view of Chao, and further in view of DeGrandpre et al. (US 6,678,275). Claims 19 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fransson in view of Chao, and further in view of Dunstan (US 6,654,371).

It is noted at the outset that independent claims 14 and 26 have been canceled, and the claims depending directly therefrom (claims 15, 18, 19, 27, and 31) have been rewritten in independent form to include all of the limitations of their respective now-canceled parent claim. With respect to the non-canceled rejected claims, Applicant respectfully traverses these new rejections and submits that they fail to create a *prima facie* case of obviousness for any rejected claim, as the rejections fail to indicate the presence of many claimed limitations in the references. Although Applicant has not exhaustively searched for every limitation that is unsupported in the references, where Applicant has been unable to locate a prior art

disclosure arguably related to a limitation, Applicant has so noted and requested that the corresponding rejection be withdrawn as insufficient to create a *prima facie* case of obviousness.

Claim 1 recites a packet scheduler comprising “inputs configured to receive requests for connecting multiple input ports to multiple output ports and outputs for configuring connections between the multiple input ports and the multiple output ports.” The rejection fails to identify the existence in the prior art of a packet scheduler with the recited inputs and outputs. Frannson’s scheduler does not have inputs to receive requests, and is in fact silent as to how packets from multiple inputs resolve contention for his output queues. Frannson also fails to disclose outputs for configuring connections between ports—his scheduler merely visits each output link in round robin fashion and selects an output queue to provide a cell for that link. There is no disclosure of any configured connections between multiple input and output ports or an arbiter having outputs for configuring such connections.

As for Chao, that reference employs multiple distributed arbiters, one at each port, and discloses no packet scheduler with the disclosed inputs and outputs. Each of Chao’s arbiters can receive requests for connecting multiple input ports to the output port associated with that arbiter, (see Chao Figs. 10 and 11), but it does not receive requests for multiple output ports as claimed.

Claim 1 also recites that the arbiter conducts multiple independent arbitrations that select input ports for the next time slot “according to both a priority and weight of packets at the input ports used for the arbitrations.” (emphasis added) The rejection fails to identify the existence in the prior art of the claimed input port selection. Although Frannson’s disclosure pairs output queues (instead of the claimed input ports) with output ports, even this teaching fails to disclose using both priority and weight in arbitration. Frannson discloses using priority, but never inquires or uses weight to arbitrate (see, e.g., Frannson Fig. 5 block 144, which resolves priority ties using sequence number, not weight). Chao does nothing to cure this deficiency.

Accordingly, considering the applied references together, they fail to teach every element of the claimed invention, and therefore fail to create a *prima facie* case of obviousness. Applicant respectfully requests that the rejection of claim 1 be withdrawn.

Regarding claim 2, the rejection fails to identify where the references teach input ports winning multiple arbitrations, rejecting all but one, and then the arbitration circuit

conducting another arbitration phase for the output ports that were rejected in the first arbitration phase. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 2.

Regarding claim 3, the rejection fails to identify where the references teach the scheduler including timers that are activated with a request, and the arbitration circuit increasing the priority for any input ports having unserved connection requests extending beyond a timer period. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 3.

Regarding claim 5, Holden et al. is cited for the proposition that multicast/unicast arbitration is well known in the art. While Holden et al. does disclose arbitration between multicast and unicast cells within a switch fabric for cells already input to that switch fabric by input ports, it fails (as do the other references) to disclose what is claimed—output port arbitrations and input port arbitrations conducted for both multicast and unicast packets. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 5.

Regarding claim 8, the rejection fails to identify where the references disclose output port arbitrations and input port arbitrations conducted according to both priority and number of bytes of the packets associated with virtual output queues. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 8.

Regarding claim 11, the rejection fails to identify in the prior art an arbitration circuit conducting a multicast arbitration and then conducting a unicast arbitration for the same time slot for any remaining unassigned output ports. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 11.

Regarding claim 12, the rejection fails to identify in the prior art the claim 11 scheduler, wherein the multicast and unicast arbitrations are conducted for both output port arbitrations and input port arbitrations as recited in claim 12. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 12.

Regarding claim 15, the rejection fails to identify in the prior art a method for scheduling connections where arbitration parameters include a weight that varies according to

a number of packet bytes in the input port buffers and a priority of the packets in the input port buffers. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 15.

Dependent claims 16-17 and 25 claim additional features using the claim 15 elements identified above as missing in the prior art. As these features are also not disclosed or identified in the rejection, the rejection fails to create a *prima facie* case of obviousness for claims 16-17 and 25.

Regarding claim 18 and at least its limitation of conducting second independent arbitrations, the rejection fails to identify the references teaching this limitation. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 18.

Regarding the original claim 19 limitations and the additional claim 22 limitations, the rejection fails to identify the references teaching these limitations. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claims 19 and 22.

Regarding claim 27, that claim includes a scheduler and multiple virtual output buffers, "wherein the scheduler conducts a multicast arbitration before each time slot to select virtual output buffers to connect to multiple output ports, the scheduler then conducting a unicast arbitration for connecting any unselected virtual output buffers to unselected output ports." The rejection fails to identify the references teaching the claimed multicast/unicast arbitration sequence. Claims 28-30 add further limitations to this multicast/unicast limitations. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claims 27-30.

Regarding claim 31, the rejection fails to identify in the prior art a network processing device conducting second independent arbitrations for unmatched input and output ports. Accordingly, the rejection fails to create a *prima facie* case of obviousness for claim 31.

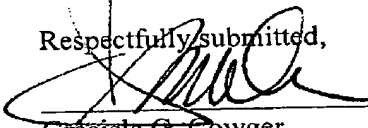
Applicant has not addressed other necessary elements of a *prima facie* case beyond the requirement that the prior art show every limitation of a rejected claim, but reserves such a discussion should the Examiner find other art that teaches the claimed elements identified above as missing. Although not every claim has been addressed in the arguments

independently, the unaddressed claims each depend from claims that have been addressed, and are therefore patentable. Applicant respectfully submits that a *prima facie* case of obviousness is missing and unsupported by the references for rejected claims 1-12, 15-19, 22, 24-25, and 27-31. Applicant requests that these claims be allowed.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

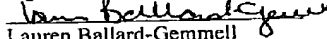
Respectfully submitted,


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Signature


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